

Bill's notes for technicians, Part 2
An overview of the FARs

Before we get started with this continuation of an overview of the FARs, there are a couple of corrections that need to be made to Part I:

- (1) Contrary to what was mentioned in Part I, IAs can not sign off the 8130-3 tag; it is only intended for repair stations, designees, and air carriers.
- (2) As of May of 1996, the FAA has three books for each volume. Book three now covers from January 1990 to present.

You'll remember that in Part I, we covered the creation of the regulations, and the basic parts of the regulations to include: definitions, general rulemaking procedures, certification procedures for products and parts, airworthiness directives, and began covering the all important Part 43, Maintenance, Preventive Maintenance, Rebuilding, and Alteration. We will continue here. Again, this is an overview of the regulations commonly used by mechanics and repairmen who work on Part 91 aircraft.

Part 43: Maintenance, Preventive Maintenance, Rebuilding, and Alteration (continued)

4. RECORDKEEPING

- The term "yellow tags" is still heard a lot on the hangar floor, but the term does not exist in the regulations. However, there is a close cousin called "Maintenance Release" which is sometimes misidentified as a yellow tag. A maintenance release is a replacement

for an FAA Form 337 for MAJOR repairs only. The maintenance release is issued only by FAA Repair Stations. It must contain two parts: a signed copy of the work order and an approval for return to service statement that has been properly signed off in accordance with Part 43, Appendix B.

- FAA Form 337: For each major repair or major alteration on an airframe, powerplant, or appliance, at least two Form 337s must be created. The original goes to the owner/operator; the other goes to the local FAA FSDO, where it will be reviewed by an FAA inspector and sent to the FAA Registry in Oklahoma City to be put in the aircraft's file. (ref.: Part 43.9 and Part 43, Appendix B, and FAA Order 8300.10 Vol. 2, AC 43.9-1E)
- Any major alteration to fuel tanks, or fuel systems such as ferry tanks, or additional fuel tank installations will require three FAA Form 337s — one to the owner, one to the FAA within 48 hours of being approved for return to service, and one in the aircraft's cabin or cockpit. U.S. Customs and DEA agents would like it displayed so they can see it from the outside. (Part 43, Appendix B and Section 91.417)
- It is interesting to note that section 91.417 of Part 91 titled Recordkeeping requires that only Form 337 for major alterations to the airframe or currently installed engine(s), propeller(s), or appliances are required to be kept forever or transferred when the aircraft is sold.
- Form 337 for major repairs are only required to be kept for a year. This is because a major repair returns the aircraft or component back to its original type design while a major alteration changes the type design; therefore, the Form 337 is part of the new type design data and must stay with the aircraft records.

5. PERFORMANCE RULES. . . for maintenance are found in only one regulation, Section 43.13. In this three-paragraph rule, paragraph (a) requires that each person performing maintenance shall use the methods, techniques, and practices identified in the "current" manufacturers' manuals or instructions as well as the tools, equipment, or their equivalent identified therein.

- The second paragraph (b) requires that the mechanic do work of such quality that the repaired or altered aircraft or component part is at least equal to its original or properly altered condition.
- Paragraph (c) is a flat statement that a Part 121, 127, 129, or 135 maintenance manual constitute acceptable means of compliance with Part 43.
- Paragraph (a) requires data, what is data, and how many kinds are there. While first data is information that supports maintenance, repair, or alteration, it can be written, typed, sketches, drawings, graphics, or photos. There are two major formats for data: one format depicts type design information usually in the form of blueprints, wiring diagrams, etc.; the second data format describes how to perform the maintenance, repair, or alteration. Within that format there are two kinds of data recognized by the FAA, acceptable and approved.
- Acceptable data is used for “normal” everyday maintenance or inspections. Acceptable data can be Advisory Circulars (AC) 43.13-1A and 2A, manufacturers’ service manuals and bulletins, engineering orders, operating limitations, stress analysis, previously approved FAA field approvals, and Part 121 and 135 operating manuals. (AC 65.19 IA Study Guide and FAA Order 8300.10 Vol. 2)
- Approved data is used to execute a major repair or a major alteration. Approved data can be:
 - (Type design information,
 - (Airworthiness directives and data referenced by an AD,
 - (An STC,
 - (A CAA Form 337, dated prior to 10/1/55,
 - (Any data approved under a FAA field approval process,
 - (An FAA Form 337 that has been approved for multiple alterations by the original modifier,
 - (PMA or TSO authorizations,
 - (Appliance manufacturers’ manuals,
 - (Any data approved under a Designated Option Authorization,
 - (Any alteration data approved by an FAA Designated Alteration Station (DAS),
 - (Foreign bulletins for use on U.S. certificated foreign aircraft, when the bulletin is approved by the foreign authority and the United States has a bilateral agreement with,
 - (Data approved by a repair station with SFAR 36 authority, and
 - (Any data stamped “FAA Approved.” (AC 65.19 IA Study Guide and FAA Order 8300.10, Vol. 2)
- Minor changes to approved data is allowed as long as the changes do not differ appreciably from the original approved data and the changes do not have a negative impact on safety. These minor changes do not require FAA approval; however, each minor deviation should be recorded on the FAA Form 337.
- Advisory Circular 43-13-1A acceptable methods, techniques, and practices, inspection and repair can be used for approved data if the data is approved for the product being repaired, if the data is directly applicable to the repair, and the data is not contrary to manufacturer’s data.
- The authority for a mechanic with an inspection authorization, or FAA repair station, or air carrier to “approve this acceptable data” is found on the signature page of the Advisory Circular. (ref.: AC 43.13-1A)

• MAJOR OR MINOR:

Determination of whether or not a repair or alteration is major or minor is accomplished by the individual performing the work. Help in making this determination is found in Appendix A of Part 43, and/or in the definitions of major repairs and alterations in Part 1. If the referenced FAR sections are no help, then I suggest you ask yourself these three questions: If the repair or alteration that is to be performed “FAILS”:

1. Can the aircraft continue to fly safely?

2. Can the aircraft land safely?
3. Are the crew/passengers safe?

If the answer is NO to any one of the three above questions, then the repair or alteration is MAJOR! If you are still not sure of this major/minor business, contact the local FAA Flight Standards District Office.

When an alteration is not completed, and the aircraft must be operated, the mechanic must determine that the incomplete alteration does not affect the safety of the aircraft, the partially installed equipment must be deactivated and placarded to prevent use, any changes to weight and balance must be noted, and the maintenance records must be completed and signed off by an authorized person to reflect the work accomplished. When the work is finally completed, a conformity inspection of the entire alteration should be accomplished before the aircraft is approved for return to service. (FAR 43.9 and FAA Order 8300.10, Vol. 2)

• FIELD APPROVALS:

There are three kinds of field approvals that are signed off by FAA airworthiness inspectors assigned to a FSDO. They are:

- (Approval of data only for major repairs and alterations,
- (Approval based on physical inspection, testing, for one aircraft, and
- (Approval of data only for duplication of the alteration on similar make and model aircraft if accomplished by the original modifier.

It is interesting to note there are no regulations that cover field approvals. Instead the three kinds of field approvals used today are covered under FAA policy. The policy dictates that the authority and responsibility to issue a field approval is designated only to the individual FAA airworthiness inspector.

There is no geographic limit to this authority. An FAA inspector in Maine can field approval a major repair or major alteration for an aircraft that is parked on a ramp in New Mexico. The decision to approve or disapprove a field approval is based on the individual FAA inspector's knowledge, skill, expertise, and ability in that particular maintenance field. (ref.: FAA Order 8300.10, Vol. 2)

Part 45: Identification and registration markings.

This part is helpful when you want to paint registration numbers on a customer's aircraft, or check DATA plates on aircraft and components for proper information. While not in the regulations, FAA policy dictates that if you lose an ID plate, get the local FAA inspector to verify that the engine, propeller, or airframe data plate is missing in writing, and send the FAA letter attesting to that fact along with your request for a new data plate from the manufacturer of the product.

Part 47: Aircraft Registration

This part talks to who can register an aircraft under U.S regulations. Many mechanics and pilots would be surprised to find that the FAA considers the most important certificate in an aircraft is the registration certificate. This is because without a valid registration certificate the FAA cannot issue an airworthiness certificate.

• FAA-certificated mechanics cannot legally sign off work on a non-U.S. registered aircraft using their A&P number. If the country of registry other than the U.S. wants the mechanic or FAA repair station to "sign off" the work, the mechanic who performed the work can sign the aircraft's logs; however, the FAA will not recognize the entry nor will the FAA investigate that mechanic for any work not done in accordance with FAR on foreign registered aircraft.

PART 65: Certification: Airmen other than flight crewmembers

Part 65, Subpart D Mechanics lays down the standards to certificate a mechanic, inspection authorization (IA) or repairman. Mechanics and repairmen must be at least 18 years of age; IAs must be at least 21 years old.

- There are two mechanic ratings: airframe and powerplant. To become a mechanic one must have graduated from an approved Part 147 Aircraft Maintenance Technician School or have at least 4,800 hours of practical experience to qualify to take the examinations. There are nine examinations for the airframe and powerplant rating: three written, three practical, and three oral.
- A properly rated and certificated mechanic can perform maintenance and inspections. However, he or she may not supervise or approve for return to service the maintenance, preventive maintenance, or alteration to any aircraft or appliance unless he or she has satisfactorily performed the work at an early date.
- Neither can the mechanic exercise the privileges of his or her certificate and rating unless he or she understands the current instructions of the manufacturer for the maintenance to be performed.
- A mechanic certificate is not current unless within the last 24 calendar months the mechanic has for at least six months of the period: served as a mechanic under his certificate and rating, technically supervised other mechanics, or supervised in an executive capacity maintenance or alteration of aircraft on any combination of the above three requirements. To get current you can work under the supervision of another A&P or prove that you are current and capable to the FAA.
- A&P mechanics cannot sign off major repairs and major alterations. Some powerplant mechanics can get into trouble, for example, if they overhaul a reciprocating engine with an integral supercharger or a recip engine with a gear reduction other than one with a spur-type propeller reduction gearing. These repairs are considered major by Part 43, Appendix A.
- To become a mechanic with an Inspection Authorization, a mechanic must be a current, active mechanic for two years out of the past three, have a fixed based of operations and have available the equipment, facilities and inspection data necessary to properly inspect aircraft and their component parts. They must also take and pass one killer of an IA test.
- The IA authorization is good for one year, from April 1 to March 31. To renew, an IA must have performed four annual inspections, or eight Form 337s, or performed or supervised one progressive inspection, completed an eight-hour refresher course acceptable to the FAA or (my personal favorite) take an oral test administered by an FAA inspector.
- Some of the privileges of an IA are: they can approve for return to service, annual inspections, progressive inspections, major repairs, and major alterations.

Part 91: General Operating and Flight Rules

This part is the catch-all for all the curious, unconventional, or unique regulations that are not a comfortable fit anywhere else.

- Section 91.213 (d) Inoperative Instruments and Equipment will allow an owner or operator to fly a rotorcraft or a nonturbine, small aircraft with inoperative equipment and instruments without an approved minimum equipment list. However the following requirements apply: The inoperative instruments and equipment are not:
 - (Part of VFR-day type certification requirements.
 - (Indicated as required equipment on the aircraft's equipment list or on the kinds of operations equipment list for the kind of flight operation being conducted.
 - (Required by a federal aviation regulation.
 - (Required to be operational by an airworthiness directive.
- Once the pilot/owner has determined that the inoperative equipment does not constitute a hazard to the aircraft is to deactivate, and placard the inoperative equipment or instrument as "inoperative" and make the appropriate logbook entry stating the equipment or instrument has been

deactivated, the date it was deactivated, note that the aircraft is in compliance with Section 91.213(d), and sign the log with his or her signature and certificate number.

- If the equipment or instrument is removed from the aircraft it must be done in accordance with Part 43. There is no time limit on the length of time a piece of equipment can remain deactivated.
- However, at each annual or 100-hour inspection the mechanic performing the inspection must ensure that the deactivated equipment or instruments are still in compliance with Section 91.213(d). The mechanic should confirm his findings with a statement on the inspection work order that the deactivated equipment or instruments still meet Section 91.213(d) and provide the owner or operator a signed list of the open, but deferred discrepancies. Additional information on this subject is found in AC 91.67, Minimum Equipment Requirements for general aviation operations under FAR Part 91.

Part 91: Subpart E — Maintenance, Preventive Maintenance, and Alterations

This part talks to maintenance, and inspection for aircraft operated under Part 91.

- Part 91, Section 91.403 General, states that the owner or operator of an aircraft is primarily responsible for maintaining that aircraft in an airworthy condition, including compliance with Part 39 Airworthiness Directives. However, this section does not relieve the mechanic from Part 43, Section 43.13, Performance Rules.
- Section 91.407, Operation after Maintenance, Preventive Maintenance, rebuilding or alteration: states that no person may operate any aircraft after maintenance unless it has been approved for return to service, and the appropriated maintenance entry has been made. This section also talks to “test flight” and requires that the test pilot be an appropriated rated, private pilot who, after making the operational checks and determining the aircraft is airworthy, must make a signed statement in the aircraft maintenance records, that the aircraft is returned to service.
- Section 91.409 Inspections. This section describes and sets forth the required inspections for Part 91 operated aircraft. For smaller single or multiengine general aviation aircraft there are three kinds of formal inspection programs:

(Annual inspections are due every calendar year. A calendar year runs 12 months but can be 30 days longer than the average year. For example if a customer has his/her aircraft annual inspection performed on March 1, that annual inspection will “run out” on March 31 or in 395 days. This inspection must be “performed” by a mechanic with a current inspection authorization.

(100-hour inspections come in two sizes, airframe and powerplant. Any aircraft that is for hire (flight instructions, banner towing, etc.) is required to have a 100-hour inspection. An appropriated mechanic must perform the inspection and sign off the individual logbook. It is not unusual for a twin-engine aircraft to have its 100-hour inspections maintenance records be signed off by three rated mechanics (one airframe and two powerplant sign-offs).

FAA allows operators of “for hire” aircraft a grace period of 10 hours to exceed the 100-hour requirement in order to en-route to a place where the 100-hour inspection will be done. The extra time over and above the 100-hour requirement must be deducted from the 100 hours. (e.g., 100-hour inspection due at 980 hours, flew five hours extra enrouting to a maintenance base where a 100-hour inspection was performed at 985 hours. The next 100-hour inspection is due at 1,080.)

(Progressive inspections must be supervised or performed by a mechanic with an inspection authorization. A progressive inspection is an annual inspection broken up into phases or events in which different parts of the aircraft are inspected at different times during the calendar year. The 10-hour grace period is also extended to operators under a progressive inspection.

An owner or operator of an aircraft who wants to put the aircraft on a progressive inspection must inform the local FSDO in writing of his or her intent, list the IA who is going to perform the inspection, develop an inspection procedures manual which will explain the inspection process, making of reports, recordkeeping, and technical reference material.

At the same time the owner or operator must also include both the detail and routine inspection schedule, sample of the reports and records and instruction for their use, have available equipment, and the housing and technical data to properly inspect the aircraft.

- For operators of large aircraft, turbojet multiengines, turbo-propeller aircraft must be inspected in accordance with one of the four inspection programs called out in Section 91.409 (e)(f). Those inspection programs are:

- (A current Part 121 continuous airworthiness inspection program.

- (A current Part 135 approved aircraft inspection program.

- (A current version of the aircraft's manufacturer inspection program.

- (An inspection developed by the owner or operator and approved by the FAA.

- With the exception of the FAA-approved inspection program, the owner or operator must have available for the FAA a copy of the selected program, a copy for the individual who is performing the inspection, and the name of the individual who is responsible for scheduling the inspections.

Another interesting note — The aircraft inspection period under Section 91.409(e)(f) is not limited to one calendar year. It could be 15 months long or 24 months long to complete an entire inspection of the aircraft.

- Section 91.415 — Changes to Aircraft Inspection Programs, allows the owner or operator to petition the FAA to allow changes to the FAA-approved inspection program developed under section 91.409(e)(f). It also allows the FAA to revise the operator's program.

- Section 91.417 Maintenance Records require that the following records will be kept until transferred to the new owner:

- (Total time in service for the airframe, powerplant(s) and propeller(s).

- (Current status of life-limited parts.

- (The time since the last overhaul of all items which are required to be overhauled.

- (Current inspection status of the aircraft.

- (Current status of airworthiness directives.

- (Copies of Form 337 for major alterations.

- This section also requires the owner or operator to hand over all required maintenance records to either the NTSB or FAA representative upon request.

- Records that are required to be kept for at least one year or superseded by other work, are:

- (Records of maintenance, preventive maintenance, and alterations.

- (Records of 100-hour, annual, progressive, or other required inspection programs.

Nice To Know Information:

- If a mechanic sees a safety problem or unsafe practice or condition that affects aviation safety, at any time, day or night, weekends or holidays and wants to report it to the FAA, they can call the FAA hot-line number at (800) 255-1111. The phone rings right at FAA Headquarters in Washington, D.C. Your identity will be kept strictly confidential, and restricted to the FAA by your request. You are protected from disclosures requested under the Freedom of Information Act.

- Advisory Circulars are a valuable source of information. Many ACs are free. A free Advisory Circular checklist #AC 00-2.9 is available from the U.S. Department of Transportation, General Services Section, M-45-3, Washington, D.C. 20590 or fax your request to the same office, (202) 366-2795.